# REPORT

ON THE

# SANITARY CONDITION

OF

# MERTHYR TYDFIL,

## FOR THE YEAR 1865.

PRESENTED TO THE

## LOCAL BOARD OF HEALTH,

ON THE 5TH OF APRIL, 1866,

BY

**THOMAS JONES DYKE,**

M.R.C.S., ENG.; & L.S.A., LOND., MEDICAL OFFICER OF HEALTH; HONORARY
MEMBER OF THE METROPOLITAN ASSOCIATION OF OFFICERS OF
HEALTH, &c., &c.

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PRINTED FOR THE BOARD OF HEALTH,
BY REES LEWIS, STATIONER, 46, HIGH-STREET.

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HYGIENE
1947
TROPICAL MEDICINE

## Duties of Medical Officer as approved by the Merthyr Tydfil Local Board of Health, the 4th January, 1866.

1.—To ascertain what local causes prejudicially affect the Public Health in this District, to inform the Board of those discovered causes, and to suggest such means for their removal as Medical Science can advise.

2.—To seek information of the occurrence of cases of epidemic, endemic, or contagious diseases, and when informed to visit the localities, ascertain the extent of the malady, the local causes likely to conduce to the diffusion thereof, and give such warning as may induce the persons affected to have recourse to medical treatment. In case of an outbreak of Small Pox—to enquire into the history thereof, and as to the practice of vaccination in the neighbourhood.

3.—To inspect any meat exposed for sale for human food, whenever required so to do by an Officer of this Board, or any Police Officer, and to give his opinion as to the fitness or otherwise of such meat being used for human food, whenever required by a Justice of the Peace.

4.—Upon any complaint received by him of the emission of any noxious or offensive smell from any process of trade carried on in any manufactory, yard, house, or premises, or of atmospheric pollution from any drains or sewers, to enquire into the causes, and report upon the means for the prevention thereof.

5.—To perform any duties imposed by any Act of Parliament on the Officer of Health, or Sanitary Inspector.

6.—To attend the Meetings of the Local Board when necessary.

7.—To Report Quarterly the nature and amount of sickness and death, the number of births, and of persons vaccinated; and to present annually a report and tabular return of the ascertained sickness and mortality of the District.

J. W. RUSSELL,

*Clerk to the Local Board of Health.*

*Merthyr-Tydfil, April 3rd,* 1866.

## TO THE CHAIRMAN & MEMBERS OF THE LOCAL BOARD OF HEALTH.

Gentlemen,

At the Board Meeting held on the 4th of January last, you requested me to prepare a Report upon the Sanitary State of the District of Merthyr Tydfil, in 1865. In compliance with that request, I present to you the following Report. The authorities consulted for the various figures and facts brought together, will be found in a note attached hereto.

I have deemed it unnecessary to describe the physical characters of the District, and the social peculiarities of the Inhabitants, as these have been twice fully detailed; 1st, by Mr. Rammell, in the Report published in 1850; and 2nd, in the Report drawn up by your temporary Officer of Health, the late Dr. William Kay, and published by your direction, in 1854.

There are still in your archives many copies of Dr. Kay's Report; I would ask that these may be distributed to the Rate-payers: a careful perusal of that Report, will show what Merthyr was in 1853. It will be my duty to set out its Sanitary State in 1865: by comparing the present with the past, the results of your labours, during the twelve years that have intervened, will become manifest.

I should have been glad to have pointed out with some exactness, the various lethal diseases and lethal neighbourhoods, where, and by which, Death still claims its many preventible victims. This, at present, I cannot do, but if it should be your pleasure that I should again report to you on the health of the town, I trust to be able to fill in the gap, as the District Registrars now give me every week, lists of the deaths that have occurred, their localities, and their causes.

The neighbourhoods in which diseases were formerly most fatal have been reduced in number by your efforts; but many places still remain, bearing evidence each week of your incompleted labours. All believe that you will steadily persevere in applying the means allowed by law, and contributed by the ratepayers, for the desired end and aim of your unremunerated, yet devoted exertions; that of giving the greatest amount of health, and the longest range of life, to each one of the inhabitants of this town.

### 1.—*The Population of the Parish of Merthyr Tydfil.*

All calculations as to the death-rate, and, therefore, as to the greater or diminished duration of human life, must be founded upon the numbers of the people. In Dr. Kay's report, page 5, table 1, the population in the district of this Local Board, is given for each decennial period from 1801 to 1851. In the table which follows, I have placed in succession the marriages, births, deaths, and estimated population for each year, from 1851 inclusive to 1865.

These details are based upon information given me by the Registrar General of marriages, births, and deaths, a return of the number of houses assessed to the Poor Rate, made 1st November, 1865, given by Mr. Edward Lewis, assistant overseer, the published abstracts of the Board of Guardians of this Union, and the census tables for 1861.

It is very probable that, notwithstanding all my care, the figures may not be accurate; the difficulties of the work have been enhanced by these circumstances:—In one set of figures, that I have had to deal with, the population of the Union, 107·105 was the basis; in another, the population of the Borough, 83·875; in a third, the population of the sub-districts of Upper and Lower Merthyr. All these have had to be reduced to, and compared with, the *estimated* population of the parish in 1865. If any slight errors should be discovered, I will trust that the novelty, as well as difficulty, of the calculations may be admitted as an excuse.

## TABLE I.

### *Population of the Parish of Merthyr-Tydfil.*

| Years. | Houses. | Marriages. | Births. | Deaths. | Estimated Population to 31st December, each Year. |
|---|---|---|---|---|---|
| 1851 | 8354 | 568 | 1954 | 1481 | 46692 |
| 1852 | ...... | 624 | 1812 | 1451 | 47006 |
| 1853 | ...... | 753 | 1904 | 1489 | 47320 |
| 1854 | ...... | 658 | 2053 | 1880 | 47634 |
| 1855 | ...... | 621 | 2074 | 1421 | 47948 |
| 1856 | ...... | 683 | 2204 | 1283 | 48262 |
| 1857 | ...... | 659 | 2289 | 1325 | 48576 |
| 1858 | ...... | 541 | 2049 | 1776 | 48890 |
| 1859 | ...... | 597 | 2254 | 1495 | 49204 |
| 1860 | ...... | 571 | 2092 | 1322 | 49520 |
| 1861 | 9395 | 485 | 1963 | 1270 | 50461 |
| 1862 | ...... | 502 | 1959 | 1264 | 51404 |
| 1863 | ...... | 552 | 1975 | 1307 | 52320 |
| 1864 | ...... | 756 | 1940 | 1328 | 53180 |
| 1865 | 10877 | 693 | 2206 | 1634 | 54000 |

In the five years—1851-55, the births exceeded the deaths by 2,072, while the population increased by only 1,256; it would therefore appear that 816 persons *left* the town in those years.

In the second five years, 1856-60, the births exceeded the deaths by

3,687, while the population increased by 1,572; in these years, 2,115 persons emigrated from Merthyr.

In the third period of five years, 1861-65, the births exceeded the deaths by 3,240, while the population increased by 4,480; in these years, therefore, in addition to retaining a number equivalent to the excess of births, 1,240 strangers have come to settle in the parish.

The number of houses in the parish in 1851, was 8,354; these, in the ten years ending 1860, had increased to 9,395, (about 104 yearly): in the five years ending 1865, 1,482 houses were built, increasing the number to 10,877. The annual increase of new houses in this latter period was 296.

On the 1st November, 1865, there were only 159 houses unoccupied.

The average number of inhabitants per house in 1861, was 5·6—in 1861, 5·27—in 1865, 5.

The deductions from the foregoing facts are somewhat unexpected. If you will refer to page 10 and 11 of Dr. Kay's report, you will there see that the increase of the population by births, from 1848 to 1853, was but 1,729, and that 5,271 strangers had settled *in* the town.

In the years, as I have given them, from 1851 to 1860, you will notice that the reverse has been the case,—that the population has gradually increased from 46,692 to 49,520; at the same time, that a large number of the people have *gone away* from the place: showing, I think, clearly that *something* had arrested the downward course of the town; which was hitherto dependent for its increase upon the flow of strangers *to* the town, to supply the place of those who fell victims to the pernicious atmosphere caused by local nuisances: that *something*, I take, to have been the sanitary improvements you have carried out, for co-temporary with their coming into operation the town has increased in population, *not* by *addition from without*, but *by growth from within*, that growth having been great enough to supply—1st, a healthy increase of 2,828 young lives; and 2nd, 2931 persons to people other towns and other lands.

In the last *five* years, the increase from 49,520 to 54,000 has been promoted by two causes—internal development has added 3,240, and immigration from other places 1,240, to the population.

The stoppage of the Penydarren Iron Works, in 1859, the uncertainty respecting the Cyfarthfa Lease, the comparatively inactive state of the Plymouth Works, during the illness of the late proprietor, and subsequent to his death, the low price of iron, and, consequently, the low rate of wages, and the extensive emigration of our people to America and elsewhere, are sufficient to account for the almost stationary state of the town, as indicated by the lessened number of marriages in 1861-62-63; while the increase of houses, inhabitants, marriages and births in 1864-65, may be set down to the greater demand for the staple product of the district—Iron—the increased export of coal, the great development of the Dowlais Iron Works, the renewal of the Cyfarthfa Lease, and the opening of new collieries for the supply of coal to those works, and lastly, the transfer of the Plymouth Iron Works to a new proprietary.

The greater number of the new houses have been built at Abercanaid and Troedyrhiw. Partial provision has been made by the landholders to carry off the surface drainage; but, unfortunately, this Board did not exercise their power of compelling the builders of the houses to form proper sewers, and to connect the closets attached to each house with the same. Long continued epidemics of contagious fevers, attended by very many deaths, have resulted in both villages.

### TABLE II.

*Occupations of Population, employed in Collieries and Ironworks, deduced from Census Tables,* 1861.

*Proportions calculated for Parish of Merthyr Tydfil. Estimated total population* 54,000 *in* 1865.

| | MALES. | | FEMALES. | | TOTALS. |
|---|---|---|---|---|---|
| | Under 20. | Above 20. | Under 20. | Above 20. | |
| Coal Miners ........ | 2098 | 4547 | 108 | 114 | 6867 |
| Iron Miners ........ | 381 | 1524 | | | 1905 |
| Iron Makers ........ | 921 | 3217 | 212 | 178 | 4528 |
| Masons, Carpenters, Quarrymen, and Labourers .......... | 246 | 1543 | 95 | 83 | 1967 |
| Totals .......... | 3646 | 10831 | 415 | 375 | 15267 |

### 2.—*Market Value of Staple Product—Iron—average Wages—and Prices of Provisions.*

The price of Iron bars, *free on board at Cardiff*, increased from £6 2s 6d. in 1862, to £7 10s. in 1865: while the wages of the *skilled adult* working men employed, increased from an average of 24s. 2d. in 1862, to 29s. 2d. in 1865. The less experienced and the youthful workmen would earn proportionately less.

The price of a sack of flour, was 43s. in 1862—in 1865 it was reduced to 32s. 2d. Potatoes fell in price from 5s. 5d. a hundred-weight to 4s. 7d.; beef and mutton increased in price from 5½d. to 6½d. per pound; bacon from 7d. to 10d. Sugar, butter, and cheese, were about the same prices in both years, while tea was reduced from 4s. to 3s. 6d. Lastly, a four-roomed cottage, which rented at 10s. a month in 1862, *without water*, might be had in 1865 at 8s. 6d. a month, with an unlimited supply of the purest water within the house.

The health of the people is always affected by the increase or diminished value of the chief manufacture carried on in a town. Table 2 will show that of the 54,000 people in the Parish in 1865, 15,000 working people were employed in getting the materials for the manufacture of Iron, in manipulating the metal obtained from the blast furnace, and in preparing it for sale; for each working person employed, there are two at home dependant upon him for food, &c.—thus 45 out of the 54 thousand were immediately dependant upon the Iron and Coal Trade. The average price of Iron would, therefore, have had a most important influence upon the health of the inhabitants generally; for poverty, the consequence of *diminished* value of the iron, would have brought in its train those diseases which afflict human beings whose health is below par; while on the other hand a large *increase* in the value of the staple product, and consequent increase of wages, is apt to induce the dissolute and the thriftless to give way to self-indulgence—the necessary sequences being the accession of diseases of other characters, but not less fatal than those which poverty induces.

The wages paid for the work done by the majority of the persons employed, contrasted with the prices of provisions, is also a measure of the healthiness or otherwise of a population. A low rate of wage coincident with high priced provisions necessarily leads to a great amount of human suffering, and consequent disease; while the contrary should imply a larger amount of health. The "inexorable logic of figures" proves it to have been otherwise. A reference to the mortality tables will show, that in 1862, when iron was £6 2s. 6d. per ton, and wages low, flour being 43s. per sack, the mortality was 24·59 per 1000; while in 1865, iron being £7 10s. per ton, wages high, and flour 32s. per sack, the mortality rose to 30.26 per 1000.

In another part of the paper I shall have to point out some of the causes of the increased mortality; but I must here say, that one of our chief ironmasters has expressed the whole truth in the remark, "that a larger number of the working men die *in the prime of life*, in good times than in bad." The cause being the excessive use of intoxicating drinks.

### 3.—*Pauperism; its influence upon the Health of the People.*

In a town or district where the majority are well-to-do in the world, it would be expected that disease would be less prevalent than in a town in which the majority of the people are dependant upon daily health to perform their daily labour.

Merthyr would be included in the latter category, as will be evident from what I have already stated, with regard to the occupations of the large majority of the people.

From the half-yearly abstracts published by the Board of Guardians, it appears that the numbers of paupers relieved by their order (taking the mean of the two half-years) have been the following in each year:

| 1861. | 1862. | 1863. | 1864. | 1865. |
|---|---|---|---|---|
| 3800. | 4375. | 4617. | 4137. | 4530. |

Remembering that the population for 1865 has been estimated at 54,000, the fact comes out, that about 1 out of every 12 of the whole people is in receipt of parish aid.

The health of this class of persons has generally been undermined by age, by poverty, or from the consequences of an irregular life, and they are therefore particularly liable to attacks of disease. That this liability exists may be seen by the following:

The number of orders for medical relief issued by the relieving officers in 1865 was 1608; of the recipients of this relief there lived in

| | | |
|---|---|---|
| Upper Merthyr, Garth district | 551 | Without Vaynor. |
| Dowlais do. | 200 | |
| Lower Merthyr, Town do. | 631 | |
| Troedyrhiw do. | 226 | |
| Total | 1608. | |

Thus 1600 out of a population of 54,000 (that is 1 out of 34) in one year asked for, and obtained parochial medical aid.

The number of medical orders issued in 1862 was 632. The large increase from that number to 1608 in 1865, may be accounted for by the fact that the Board of Guardians, in 1863, divided the parish into 4 districts, and appointed a separate medical officer to each. Medical aid being thus rendered more accessible, it is probable that it has been more sought for; a desirable end, I think, as unquestionably the *early* treatment of disease is the most frequently successful.

But on the whole it is *not* satisfactory to a ratepayer to have to bear in mind that eleven must work to keep the twelfth; nor is it satisfactory to know that of the whole population nearly 5000 people are so poor that in sickness they need parochial medical relief.

In another point of view, these last figures are of value, in pointing out that two out of the four districts contain a much larger proportion of paupers than the others do. The fact is that the poor have settled in the low class houses in the old parts of the town, and as this class of houses have rarely *thorough ventilation*, and usually have *no conveniences*, the predisposition to disease consequent upon poverty is greatly increased by *bad air* and *bad smells*. These deficiencies lie within the province of *your* officers to discover, and they can be legally remedied by means which *you* can direct.

## 4.—*Interments in the Burial Grounds within the Town.*

### TABLE III.

*Places of Burial, and Numbers Buried in* 1865.

| | | | |
|---|---|---|---|
| 1. Cefn Cemetery | 447 | Dowlais Church Cemetery | 268 |
| 2. Thomas Town Burial Ground | 244 | ,, Public ,, | 192 |
| 3. Adulam Chapel, ,, | 3 | ,, Hebron Chapel Ground | 16 |
| 4. Tabernacle ,, ,, | 2 | ,, Hermon ,, ,, | 9 |
| 5. Cae-pant-tywyll ,, | 8 | ,, Bethania ,, ,, | 1 |
| 6. Zion Chapel, ,, | 4 | Penydarran—Elim ,, ,, | 35 |
| 7. Bethesda Chapel ,, | 1 | ,, Horeb ,, ,, | 10 |
| 8. Abercanaid ,, ,, | 48 | Troedyrhiw ,, ,, | 36 |

TOTAL...... 1,324,

Thus of the 1634 Deaths in Merthyr in the year 1865, the bodies of 1,324 were buried in the above-named places of sepulture. 310 bodies were interred elsewhere.

It is satisfactory to know that the practice of interring the dead at a distance from the abodes of the living, is gaining ground, as it is shown, that in 9 cases out of 13 surviving relatives have chosen to bury their dead in the Public Cemeteries. It is exceedingly *un*satisfactory to notice, that the Burials in the Church Ground of Thomas Town, numbered 244, and equally so that interments still take place in the grounds of Hermon Chapel, Dowlais; of Elim and Horeb Chapels, Penydarren; and in those attached to five other Chapels in Merthyr.

It is not always that one is able to connect cases of disease with Burial Grounds, but with regard to Elim and Horeb Chapel-grounds I am enabled, from having been employed in that district for ten years, as Surgeon to the Dowlais Iron Company, to say that I frequently noticed that sicknesses occurring to persons resident near thereto, assumed most unfavourable characters. I particularly noticed this in the houses from No. 124, to 132 Penydarran Road, which are immediately under Elim Burial Ground; and in the four houses in Royal Arms Court, to the east of Horeb Burial Ground wall. During the recent epidemic of Typhus—that disease prevailed in each of the four houses in the Court. I attended 7 cases in one house, and 6 in another.

You will, doubtless, remember that complaints have been made that an offensive effluvium was frequently perceived in the neighbourhood of the Thomas Town Church Burial Ground; and when you learn that in this ground (which was pronounced to be well nigh full in the spring of 1864,) 184 bodies were interred in 1864, and 244 in 1865, making 428; you will be convinced that the complaint was well-founded.

It is admitted to be unhealthy to inter the dead among the residences of the living, and therefore, places of sepulture beyond the limits of the Town have been provided. It is for you to enquire whether all the Burial Grounds within the precincts of the Town, should or should not be closed. If you should decide that this step is necessary to be taken—and I, as your

Officer of Health, fully aware of the evils, now declare it to be my opinion that there is a necessity for so doing—the proper orders will, without doubt, be issued by the Department of the Privy Council entrusted with the duty.

### 5.—*The Weather, Temperature, Rainfall, &c., in* 1865.

The influence of Temperature, of the Rainfall, of winds, and of atmospheric pressure, in the production of disease, are well-known. My appointment as Officer of Health took place at so late a period of the year, that I am not able to give you any detailed account of these external influences, from my own observations. But I beg to lay before you the amount of Rainfall (Table 4), which I have received from a member of your Board, Mr. Scale; and I also add abstracts from "Remarks on the Weather," formed by Mr. Glaisher, from the returns received by him from 50 stations in England and Wales, and published by the Registrar General in the Quarterly Reports for 1865.

TABLE IV.

*Rainfall in* 1865—*Registered by E. W. Scale, Esq., at Troedyrhiw, Merthyr-Tydfil.*

*Top of rain gauge,* 3 *feet* 6 *inches above ground,* 500 *feet above sea. Lat.* 3.20 *west ; Long.* 51.44 *north.*

| MONTH. | INCHES. | |
|---|---|---|
| January | 5.10 | |
| February | 4.78 | |
| March | .00 | |
| | | 9.88 1st Quarter. |
| April | .50 | |
| May | 4.70 | |
| June | 2.70 | |
| | | 7.90 2nd. do. |
| July | 3.78 | |
| August | 4.90 | |
| September | .27 | |
| | | 8.95 3rd. do. |
| October | 7.79 | |
| November | 9.95 | |
| December | 5.90 | |
| | | 23.64 4th. do. |
| Inches | | 50.37 |

1st Quarter.—Mr. Glaisher says the month of January opened with cold frosty weather; on the 4th, a warm period set in which lasted until the 16th; from the 17th to the end of the Quarter, the weather was particularly cold: the temperature in March was so cold that we have to go back 20 years to find a period of so low a temperature. Snow storms were so frequent, that snow fell on 81 days during the Quarter, at one or other part of the country; on some days over the whole of England and Scotland at the same time.

2nd Quarter.—On the 5th of April, a sudden change from the wintry weather hitherto prevailing took place, and from this time until the 10th of June, the temperature was above the average.

3rd Quarter.—In the early part of July, the weather was unsettled, Rain fell frequently, and harvest work proceeded slowly; towards the end of the month the weather became clear and dry. From the beginning to the end of August, the temperature was low; after the 20th there were intervals of bright sunshine, and with the month of September came an auspicious change: the sun shone brilliantly; the temperature was high; there was but little cloud either day or night, and harvest work was completed earlier than for many years past. The Wheat crop was variable in quality, and fell short of an average.

4th Quarter.—Fine and dry weather prevailed in the early part of October; about the 18th rain fell, and stormy weather continued to the end of the month, and up to the 10th of November. For a week, the weather was fine; but from the 17th to the 22nd, the Barometer fell rapidly; a fearful gale followed, and continued for many days. In the early part of December, the air was warm and mild, trees budded, and daisies were in flower. Towards the end of the month violent gales occurred.

### TABLE V.

*The Weather and Death-rate in* 1865.

| | ENGLAND AND WALES. | | | | MERTHYR-TYDFIL. | |
|---|---|---|---|---|---|---|
| | Temperature. | Barometer. | Rainfall. | Death-rate per 1,000 | Rainfall. | Death-rate per 1,000. |
| 1st Quarter | 36·5 | 29·6 | In. 6·10 | 27¾ | In. 9·88 | 41 |
| 2nd ,, | 56·2 | 29·9 | ,, 7·25 | 22¼ | ,, 7·90 | 32 |
| 3rd ,, | 62.5 | 29·8 | ,, 6·50 | 21½ | ,, 8·95 | 22 |
| 4th ,, | 46·0 | 29·7 | ,, 9·25 | 23½ | ,, 23.64 | 26 |
| | | | Total 29·10 | Mean 23¾ | Total 50·37 | Mean 30¼ |

## 6.—*The Water Supply of Merthyr in* 1850 *and in* 1865.

I will first briefly show what the water supply of Merthyr and Dowlais was in 1850; next shortly describe the works you have caused to be executed, after the plans of Mr. Hawkesley, by Mr. Samuel Harpur; and lastly state what the present water supply is.

In Mr. Rammell's report, page 37, you may read that the supply was, in 1849 and 1850, derived from wells, springs, the river Taff, and the Pond. He says, "The *public* wells in *Merthyr* numbered 12 (population 30,000), from which water, good in quantity, but bad in quality, was to be had by payment. Wells attached to private houses gave a good quantity of water when they had been sunk into the gravel below the sandstone rock, but the quality was bad, as the cesspools in the neighbourhood affected the taste and smell of the water." At page 33, Mr. Robert Jones says, "I use water from a pump on the premises; it will not keep more than a day without smelling offensively." Page 39, Mr. William Harris says, "The pump water is hard, and does not draw the strength out of the tea so much as soft water; it deposits a great sediment when boiled, and affects the health of the people who drink it. There are some pumps at Twynyrodyn; water taken from these on Saturday was by Monday morning so offensive that it could not be used. At Coedcae Court there is a spring, it is on the hill side, below the Parish burial grounds; when this water is kept 24 hours it is impossible to drink it, on account of its offensive smell, *which is like that arising from decayed animal matter*. The people living in that part have *no other water to drink*." So much for the quality of the water.

As to the quantity, Mr. Rammell says, "The springs mostly used by the poorer classes are at a distance from the houses: much time is occupied in going to, and returning from them. In summer especially, this is the case, the water dripping from the spouts, or slowly accumulating in the small hollows around the springs, has to be carefully collected in the pitchers or kettles." Mr. Bruce says, "in dry summers, quarrels arise amongst the people waiting at the spouts. I understand they wait there the greater part of the night." Mr. Walter Thompson, said, "I think Merthyr not a quarter supplied with drinking water." Mr. W. S. Clark, stated, that the supply of water was deficient, and that he thought an improvement in the condition of the people would be the consequence of a full supply. Mr. Edward Lewis stated, page 41, "that the waters of the Taff River, on arriving at Merthyr, were almost black, and quite unfit for domestic use: there is no doubt that house refuse is emptied into it. In my opinion, the present supply is insufficient, this want of water is a great drawback to the cleanliness of the people."

Then as to Dowlais, population 10,000: the Rev. Evan Jenkins, says, page 37, "during winter—there are from 6 to 8 springs, some half-a-mile, some a mile distant from the houses; but in summer, these are often reduced to three, the remainder being dried up. At these water springs, I have seen 50, 80, and as many as 100 people waiting for their turn, the women have told me that they have waited 6, 8, or 10, hours for their turn. They have *no other supply of water whatever*, fit to drink, in summer time." Mr. Wrenn states, " I have repeatedly seen, at Dowlais, women out all night at the spouts waiting for water." Mr. R. Frederick, says, " I know families who keep an extra servant to fetch water." Mr. J. L. White, then chief Surgeon of the Dowlais Iron Works, describes a *novel* mode of water supply lately come into *vogue*: a labouring man procures water from a most abundant spring, *two* miles from Dowlais, brings it to the town, and the people eagerly buy it at a *½d. a jug*, and a *penny a pailful.*

It should be noted that this spring from which Dowlais was supplied with drinking water for many years, gushed out of the solid limestone rock—and was exceedingly hard.

A measure of the hardness of water is, the amount of a solution of soap, in spirits of wine, which is required to saturate the lime and other earthy impurities dissolved in the water: and *each measure* or *degree* of hardness expresses the *number of grains* of carbonate of lime, &c.

At page 41, of Mr. Rammell's Report, the degrees of hardness of the following wells and springs of water, examined by Dr. Lyon Playfair, are given.

| | | |
|---|---|---|
| "No. 1. | Spout or Spring behind Barracks, Dowlais .. | 18. |
| ,, 2. | Do. near Dowlais House ........ | 24·11. |
| ,, 3. | Well, opposite Caedraw, Merthyr .......... | 15·24. |
| ,, 4. | Caedraw Pump, ,, .......... | 24·98. |
| ,, 5. | Price's Pump, Market-square, Merthyr...... | 29·20. |
| ,, 6. | Spout or Spring, Plymouth-road, ,, ...... | 33·28. |
| | Mean degree of hardness of above 6 springs .. | 24¼. |

This analysis only gives the degree of *hardness* caused by the presence of Lime, Magnesia, &c. No examination of the water for the detection of animal matter in solution was then made; but in 1851, (preparatory to giving evidence before the Committee of the House of Commons, upon the first Merthyr-Tydfil Water Works Bill) I examined the water from No. 5, pump; and obtained from *one* gallon a *dried* residue, amounting to 43 *grains;* this was burnt in a platinum crucible, and then only 3 *grains* remained; the rest was *sewage* matter from the neighbouring cesspools."

## *The Works executed by this Board for the Provision of Water to Merthyr and Dowlais.*

At the outset, two requirements had to be fulfilled, one difficulty to be overcome: the first requirement was that water should be supplied to Merthyr and the suburbs *below* it; the next that Dowlais, up to the turnpike-gate (678 feet above Merthyr), should also be supplied: the difficulty lay in the necessity of providing for the mill-owners, as much water as they were then using.

Mr. Rammell suggested in 1849 (page 55) a reservoir at Cwm Mill, in the valley of the Taff Fechan, on the red sandstone, but only just above the out-crop, in the river, of the carboniferous lime-stone—this latter rock continues to crop out along both sides of the valley for a distance of two miles, all the lateral tributaries of the river being very hard, from the presence of lime. If the supply had been taken from this spot, it could not have been less than $8^\circ$ of hardness. This scheme was abandoned.

But Mr. Rammell also stated that a favourable site for a reservoir existed at Pentrewernen—two miles higher up the valley, beyond the last crag of limestone, on the red stone. He stated that water obtained from this spot would not exceed $2\frac{3}{7}^\circ$ degrees of hardness.

By your direction Mr. Hawkesley surveyed the district, and after enquiry, fixed upon the neighbourhood of Pentrewernen, as the location whence to draw the water supply for Merthyr and Dowlais.

His scheme was to draw the water directly from the river—to convey it in iron pipes to a hill-side near Merthyr, there to form filter beds and a service reservoir: to supply Merthyr and the lower part of Dowlais by a duly regulated fall of the water; and to force the supply for the top of Dowlais up by engine power. To supply the mill-owners, a reservoir to be formed below the straining basin, of sufficient capacity both to give in dry seasons as much as those proprietors were entitled to, and also to retain 20 million gallons for the Town supply.

This scheme you approved of; and being sanctioned by Act of Parliament it was carried out, under Mr. Hawkesley's directions, by Mr. Samuel Harpur, as Contractor for the Works, at the Compensating Reservoir and the Filter Beds; and by Mr. Thomas Crump, Contractor for laying Iron Mains and Branches.

The Straining Basin is placed in front of Pentrewernen 1,079 above the sea; 530 above Merthyr. The Filter Beds at Penybryn, are 400 feet above the Town: 921 above the sea. The service Reservoir at Top of Dowlais is 1,202 feet above the sea.

The storage or compensating Reservoir at Pentwyn was formed by throwing an embankment, 80 yards long, across the narrow gorge of the valley. The lake thus formed contains, when full, 63 millions of cubic feet of water: and covers 98 acres, of the average depth of fourteen feet.

The filter beds, depository tanks, and service reservoirs, were commenced in October, 1859, and finished in September, 1861.

The storage reservoir at Pentwyn was commenced in December, 1859, and finished in February, 1863.

The first supply of water from the Taf-fechan river and Callan brook was given in February, 1861: the full supply to Merthyr in November, 1861.

There was borrowed for the execution of the works, £82,000. It has been expended thus:

| | | | |
|---|---|---|---|
| Cost of Pentwyn compensating Reservoir .... | 25300 | 0 | 0 |
| Filter beds, depository tanks, and service reservoirs and engines at Penybryn ................ | 13310 | 4 | 0 |
| The main and distributing pipes, from 14 inches to 2 inches, diameter: 41¼ miles in length ...... | 26464 | 3 | 10 |
| Hydrants and valves ........................ | 1612 | 16 | 10 |
| Service pipes under streets and roads ........ | 3645 | 0 | 6 |
| Engineering, surveying, &c., &c. ............. | 4425 | 1 | 9 |
| Parliamentary expenses and law charges: 1st Act, obtained in 1852 ...................... | 4485 | 16 | 2 |
| Parliamentary expenses and law charges: 2nd Act, obtained in 1858 ..................... | 2122 | 1 | 5 |
| Advertising, stationery, &c. ................. | 410 | 13 | 1 |
| Balance, to be used in supplying Heolgerrig .. | 224 | 2 | 5 |
| | £82,000 | | |

How efficiently the works have been completed, each inhabitant of Merthyr can bear testimony. The results are these:—

1. 990,000 gallons of water per day are supplied to the inhabitants of the town.

2. The Mill-owners, having their usual unlimited quantity in wet weather, have had, in dry weather, instead of 120 cubic feet per minute, 1,200 cubic feet, or about 34 tons, per minute.

3. The revenue at present derived from the sale of the water amounts to £4,200 a year.

Lastly, the water supplied does not, on an average, exceed *three* degrees of hardness, as the following trials will show:—

A.—Water from Water-works tap in Merthyr, taken on 10th day of March, after ten days of fine weather: Mean of three trials by Professor Clark's soap test .................................. 3·5

B.—Water taken on 24th March, 1866, after three days of wet weather: Mean of three trials by soap test ..................... 2·2

Mean ........ 2·85

Thus, to 50,000 inhabitants of a Town, high in the Hills of Wales, who had hitherto been compelled to use water, in small quantities, of 24½ degrees of hardness, and full of sewage impurities, you have, by the first expenditure of about 32s. a head, and an annual payment of *twenty pence* a-head, given:

An unlimited supply of water, free from organic impurity, and of only three degrees of hardness!—

A water supply equal to the best, in quantity and quality, supplied to any place in the United Kingdom.

Not only this, but by the construction of the compensating reservoir, you have afforded to the mill-owners, in dry summers, *ten times* as much water *every minute* as they were accustomed to have; enabling them to keep their iron works in full operation in seasons of drought, and thus benefiting the working men.

### TABLE VI.

*Rate of Mortality from* 1851 *to* 1865.

| Years. | Population. | Deaths. | Death-rate per 1,000. | Epidemics Prevailing. |
|---|---|---|---|---|
| 1851 | 46692 | 1481 | 31·72 | Typhus, Small-pox. |
| 1852 | 47006 | 1451 | 30·87 | Typhus, Small-pox, Measles. |
| 1853 | 47320 | 1489 | 31·48 | Typhus, Measles. |
| 1854 | 47634 | 1880 | 39·46 | Typhus, Scarlet Fever, Cholera. |
| 1855 | 47948 | 1424 | 29·72 | Typhus, Measles. |
| 1856 | 48262 | 1283 | 28·58 | Typhus. |
| 1857 | 48576 | 1325 | 27·27 | Typhus, Small-pox. |
| 1858 | 48890 | 1776 | 36·08 | Typhus, Small-pox. |
| 1859 | 49204 | 1425 | 30·38 | Typhus, Scarlet Fever, Measles. |
| 1860 | 49520 | 1322 | 26·69 | None. |
| 1861 | 50461 | 1270 | 25·17 | Measles. |
| 1862 | 51404 | 1264 | 24·59 | None. |
| 1863 | 52320 | 1307 | 24·97 | Scarlet Fever. |
| 1864 | 53180 | 1328 | 24·97 | Scarlet Fever, Measles, Small-pox, Typhus. |
| 1865 | 54000 | 1634 | 30·26 | Typhus, Scarlet Fever, Small-pox, Measles. |

| | | |
|---|---|---|
| Mean of five years, 1851 to 1855 | 32·65 | Gain, 2·85. |
| Mean of five years, 1856 to 1860 | 29·80 | |
| Mean of five years, 1861 to 1865 | 25.99 | „ 3·81. |
| Total gain of lives per thousand.... | | 6·66. |

### 7.—*Rate of Mortality in Merthyr Tydfil, from* 1861 *to* 1865.

In table 6 you will find, opposite to each year, the population, deaths, and death-rate. I have added from the records of my private practice the diseases which prevailed as epidemics during those years.

In the first period of five years—1851 to 1855—the deaths were at the rate of 32½ per 1000 per annum. During each of those years typhus fever prevailed. Measles during 3 years, small-pox in 2 years, scarlet fever in one year, and cholera in the year 1854.

In the second period of five years the death-rate sank to 29¾ per 1000. Typhus was prevalent, but fewer cases occurred than during the previous period. Small-pox occurred in two years, measles and scarlet fever in one. In 1860 the town was free from epidemics.

In the third period measles prevailed in 1861—no epidemic disease in 1862. Scarlet fever commenced in the autumn of 1863, and continued until the spring of 1864. Measles and small-pox spread widely in 1864, and towards the end of the year, typhus fever in a very virulent form set in. I had not noticed a case of this disease, until then, since 1859. During 1865, typhus, small-pox, measles, and scarlet fever were epidemic in some part or other of the parish throughout the whole year. Yet notwithstanding this wide spread sickness, the mortality only rose to 30¼ in a thousand. On the whole period of five years, 1861 to 1865, the rate of mortality was but 26 in a thousand; a diminution of death rate as compared with the second period of 3¾ per thousand, and as compared with the first period of 6½ per thousand.

This favourable result of your labours must be chiefly ascribed to the water supply. In 1861 the town of Merthyr was partially supplied with water from stand-pipes; in 1862 the works were completed, and the supply became general—the mortality in that year was but 24½ per 1000. In 1863-64, the death rate still continued very much below the average.

Though much of the sickness in 1864-65 must be attributed to the exceedingly dry summers, and to the excessive cold of the spring of 1865; it is, I fear, too true that some of the evil must be attributed to a want of energy on the part of your officers appointed to see that the scavengers had performed their duty; if this had been well done, it would not have been possible for me, in tracing out the places where deaths from typhus had occurred, to have been able to point out such a vast and unexpected number of ash-heaps, manure-heaps, and overflowing cesspools, which the reports made to you in October and November disclosed.

### 1.—*Mortality from Particular Diseases in* 1865.

In Table 6 you will remark that the deaths increased from 1328, in 1864, to 1634, in 1865: an addition of 306.

In Table 7 are given the numbers of Deaths from the principal causes of mortality, and you will notice that Scarlet Fever, Measles, Small-pox, and Typhus Fevers, destroyed 393 lives, thus plainly indicating the causes of the increased mortality.

It is rare, indeed, for a community to be afflicted with the four contagious Diseases, above-named, epidemic at the same time. This infliction caused the deaths of nearly a fourth of the whole number, who died in the year, and raised the rate of mortality from 25, in 1864, to 30¼ in a 1,000 in 1865.

Assuming that the persons subjected to the attacks of the above-named diseases were in good health, and that the neighbourhood was clean and the water supply good, the mortality of the persons afflicted would scarcely exceed 1 in 20; but, taking the deaths as 1 in 12 only, and deducting the cases of Typhus—86—(which will be treated of separately) then 307x12, would give 3684 as the probable number of cases of sickness from the three first named epidemic diseases, in 1865. If these 3,684 cases had occurred in the healthy district assumed to exist—where the mortality would have been 1 in 20—then only 184 would have died; the difference 123, is the death-toll, through *three* diseases, which your people have paid during *one year*, for dirt, foul air, and foul smells.

You will remark that scarlet fever and measles carried off 239 persons: one-seventh of the whole number of deaths. In almost all cases, children under five years of age were the victims.

The mortality from these diseases was also great in 1864, the epidemics having reached their height about Christmas in that year. The usual duration of an epidemic in Merthyr is six months, and the recurrence takes place every five or six years. Doubtless, the measures you have already carried out, and those upon which you are now engaged, will do much to lessen the rate of mortality, from these diseases, but in the construction of the ventilators to the sewers you are forming, the greatest care should be taken to disinfect the upward current of sewage air; for the Registrar General of Births, &c., says "that the Zymotic matter of Scarlet Fever floats in the air of unventilated rooms, is attached to the clothes and furniture, and its corpuscles are collected in the middens, the cesspools, and the drains."

### 2.—*Small-Pox.*

The deaths from Small-pox were but 68 in the year: the average rate of mortality is 1 out of 5: so that about 340 cases of this *preventible* disease occurred last year. It was most satisfactory to find that, as a rule, cases of Small-pox occurring to persons who had been vaccinated were very rare. In cases occuring to adults, the persons attacked were generally immigrants from the neighbouring counties.

The number of persons vaccinated in the year, by the public vaccinators, was 1,478. Of these, 1,356 were under one year of age. Comparing this latter number with that of children born in the year—2,206—it would appear that 850 of those children were unvaccinated. It is necessary to make allowance for those who died in earliest infancy, about 20 per cent: 441—leaving 409 unvaccinated.

The Board of Guardians have been careful to divide the parish into such districts that the places appointed for gratuitous vaccination are easily accessible, and the parents are duly informed by the Registrars of Births of the place and time of vaccination.

It is to be hoped that the means so generally afforded the public for procuring this great protective against Small-pox will be universally used, as it has been indisputably shown that of children who have *four or more* good *circular* marks of vaccination, not more than one in a thousand takes Small-pox; and that *one* would have the disease in its mildest form.

Again, I must quote the remarks of the Registrar-General: in his 21st report, he writes:—"Small-pox exists now almost on sufferance, and *only* owing to the *neglect*, or to the *inefficient* practice of vaccination. It is not possible to determine who is to blame for not procuring for the helpless children the protection which the legislature has provided against the small-pox. The Coroners, by holding a certain number of inquests, might ascertain how the matter really stands, and thus prevent acts of negligence, which, in their consequences, are as fatal as the ordinary offences of manslaughter."

## TABLE VII.

1865.

*Principal Causes of Deaths, and numbers due to each.*

| | All Causes. | Scarlet Fever. | Measles | Small-pox. | Typhus Fevers. | Bronchitis. | Consumption, &c. |
|---|---|---|---|---|---|---|---|
| 1st Quarter | 508 | 54 | 42 | 42 | 40 | 28 | 89 |
| 2nd ,, | 453 | 52 | 12 | 17 | 27 | 14 | 80 |
| 3rd ,, | 297 | 34 | | 9 | 12 | 7 | 57 |
| 4th ,, | 376 | 45 | | | 7 | 9 | 55 |
| | 1634 | 185 | 54 | 68 | 86 | 58 | 281 |

| | | |
|---|---|---|
| Deaths from all causes ..... ................... | | 1634 |
| Deaths from Contagious Epidemics ........ | 393 | |
| Deaths from Disease of Lungs ............ | 339 | |
| | | 732 |
| Deaths from other causes than above .......... | | 902 |

……

*Death-rate in Merthyr, as compared with other Cities and Towns in* 1865.

| | | |
|---|---|---|
| London and Suburbs ........ | 1 in 38, or 26 | per 1000. |
| Dublin .................... | 1 ,, 36, or 28 | ,, |
| Merthyr Tydfil............... | 1 ,, 33, or 30¼ | ,, |
| Glasgow ................... | 1 ,, 30, or 33 | ,, |
| Liverpool .................. | 1 ,, 27, or 37 | ,, |

### 3.—*Typhus and its allied fevers.*

I devote a separate paragraph to the consideration of these fevers as much from the excessively fatal nature of the diseases as from the conviction that the public generally do not realize these two facts,—that the causes are known, and that they are removable.

It is believed by those who have attended to these matters, that the germs of all contagious diseases are *living things* given out from the bodies of the sufferers. Each *particular disease* having its cause or origin in some *one particular living thing.*

These germs or seeds of disease pass off from the sick by the breath, from the skin, but notably from the excretions from the bowels.

A child carried into a room where another child is ill of measles or infantile fever, breathes the air, and if susceptible, that is, if not in good health, is likely in so breathing to take in the seeds of the disease into its own body. A housemaid who makes the bed of a person who has had scarlet fever may inhale the fine particles thrown off from the skin which are floating in the air of the room, and have therefrom scarlet fever. The nurse attending, or the doctor visiting persons ill of typhus, take into their bodies by the air they breathe in the sick room the peculiar germs of that disease. With regard to fevers of the typhus kind, it is well established that the excretions from the bowels of the patients have in them the causes of the disease, and that when these are thrown upon ash-heaps, or into cesspools or water closets, and thence find their way into sewers, there these exceedingly minute living seeds of disease are propagated in innumerable myriads.

This being so, a man may justly say, the causes of typhus fever being known, the particular places where these causes exist and grow being also known, it simply requires power to remove the known causes, to use that power, and *the disease could not be.* Such you have *proved to be the fact,* for some years ago you drained and sewered the "Cellars"—until then the most unhealthy part of Merthyr—and yet though the same class of people live there, and though the fever raged around the place all through the year, not only not a single *death* occurred there, but not a *single case occurred.*

If this be true, then it should follow that wherever typhus has been, there was in that place a *known cause* of the disease, which your appointed officers *might have removed.* It has been said that there must always be cases of typhus. Yes—but only where the powers given by law have *not* been used, or where duties have been *neglected.*

I would ask every one who may read this to let the truth sink deeply into their minds—that typhus fevers may be prevented. 1st. By not permitting overcrowding in dwellings. 2nd. By insisting upon the thorough ventilation of houses. 3rd. By the removal of human filth from the neighbourhood of dwellings.

The deaths from typhus during the year were 86. Of these 11 occurred at the Union Workhouse, but as a large proportion of the cases in the infirmary of the workhouse had been removed from the town, we may take 80 as belonging to the district of Merthyr, the remaining six having been removed from neighbouring parishes.

Eighty out of a population of, say 53·500, does not appear many—it is but one out of 668. But it must be remembered that for every death there were on an average *nine* other cases of these fevers which recovered. The figures will now appear of more importance. Eighty died of the disease, 80 x 9 = 720 who recovered. Eighty added to 720 gives *eight hundred* as the probable number of persons who suffered from typhus fevers in Merthyr Tydfil in the year 1865,—that is, 1 out of 67 of the population.

If you will recal to your minds the reports I made to you in October and November last, in which I stated in detail the impurities I had noticed during the visits I made, in those two months, to above 100 different fever localities, and will remember the remark of Mr. Cresswell, the surgeon to the Dowlais Iron Works, that "he had attended cases of typhus fever in every street in Dowlais," you will not think the estimate excessive.

Connected with the subject of this paragraph is the question of the safe ventilation of the sewers you are now forming. The mode proposed by your surveyor is the one usually adopted. Open gratings are placed in the middle of the streets, over the mouths of small shafts which communicate with sewers. There is a constant upward current from the sewer into the open air. The foul air from the sewer will contain myriads of *living things capable of propagating in human beings the particular disease from which each originated.*

How with *safety* to the public health to ventilate sewers is admitted to be an unsolved problem. It is easy to ventilate, but it is difficult to kill the living germs of disease floating in sewer air. The experiments of the late Dr. Herbert Barker have, I believe, pointed out how the difficulties may be overcome. He has demonstrated that there are certain chemicals which not only deodorize sewage air, but also destroy the living things in it.

I would ask you to refer this question to the careful re-consideration of your surveyor. I am sure he will be able to design a chamber in the pipe leading from the ventilating shafts in which deodorization and disinfection may be not only efficiently but economically conducted.

The number of cases of typhus fever treated in the Union Workhouse was 71. The deaths, as I have said 11—1 out of 6½,—the usual proportion of deaths from these diseases in the hospitals of England and Wales being about 1 in 6. The poverty of the patients, and their low nervous power, will largely account for the fact that the proportion of recoveries from fevers treated in hospitals is not so great as when patients are treated in their own homes, but on the other hand, the danger of diffusing the disease is obviated.

In constructing the Union Infirmary some sanitary errors have been committed. The removal of these would conduce to the healthiness of the building. I allude to the situation of the water closets. In those attached to the four lower wards the current of the air is from without through the closets into the wards; in those for the two upper front wards, the in-current of air is through the closets into the passages. In the wards at the back, where fever cases are placed, the closets are outside the doors of the lobbies leading to the wards. In each of these instances the air passing into the building must be largely charged with tho effluvia arising from human excretions.

It has been shown that the excretions of fever patients can and do produce in others the like diseases; it would therefore be wise to isolate the fever wards from all ordinary commudication with the wards and closets frequented by other sick people.

The mortality from consumption and diseases of the air-tubes must ever in Merthyr, as elsewhere in this changeable climate, rank high: but it is probable that the occupations of a large number of the men who work underground may have much to do in raising the average.

In taking a summary view of the progress of the public health in Merthyr, it may, I believe, be justly said, that previous to the formation of the Board of Health the town was most filthy and most unhealthy. Shortly after the establishment of the Board, as gutters were formed, pavements laid, and some attempt at the removal of nuisances made, the appearance of the place improved, but typhus fever, the tell-tale of a bad sanitary state, was ever prevalent.

In 1855 the daily removal of the well-known hot beds of disease, ash-heaps, &c., was determined on, and very shortly favourable results followed. Diseases became less fatal—typhus less prevalent, so that in the five years ending 1860, as compared with the five years ending 1855, the death rate was reduced from a rate of 32½ to 29¾ per thousand, the effect of which may be thus expressed: that if the former rate of mortality had continued during the second period, 6,574 persons would have died. The number who did die was 6,001, so that the measures you had adopted had been the means of saving 573 lives.

Again, as to the last five years, 1861 to 1865. Had the mortality continued in those years at the same rate as in the first five years, 8,547 persons would have died. Instead of that number the deaths were but 6,803, a saving of 1,744 lives in those five years. This was a period during which the scavenging was regularly carried on; new paved gutters formed, pavements carefully laid, and an abundant supply of pure water provided. You will notice that typhus fever did not prevail in the three first years.

It is just and right to attribute the improvement in the health of the people to the improved sanitary arrangements which you have directed to be made.

The cost of the water works have been stated in detail; it has also been shown that the expenditure per head for a population of 50,000 was 32s. first cost, and 20 pence a year regular payment.

I have already detailed what you have given the public and the mill-owners for this money; but more than that, let it be borne in mind, *to your lasting honour*, that by the means which you have adopted, the lives of two thousand three hundred human beings have been saved; and as each death would have represented ten other cases of sickness, twenty-three thousand persons would have been spared the pains of disease.—"*Macte virtute.*"

In the foregoing I have endeavoured plainly to set down the remarks that have occurred to me from a careful contemplation of the facts and figures that I have been favoured with. I am now occupied in collecting materials, considerably more in detail, and shall be prepared, if you should desire it, to present you early in 1867 with a full account of the sicknesses and deaths occurring in various localities in the towns, thereby affording you data by which your surveyor may speedily and surely remove the causes which deteriorate the health of the people.

It would materially assist me in my enquiries if you will permit me to continue to receive from the registrars of births and deaths a weekly return of persons who have died, and the causes, &c., of death. I shall thereby be enabled early to discover the presence and locality of contagious disease, and can give you timely notice, both of the fact and of the means to be adopted to prevent the spread of infection.

2nd. I would ask that your surveyor should prepare and present to you quarterly a report, which should include the improvements in water supply to houses, in drainage, in ash-pits, in paving, in cleanliness and repair of houses, in ventilation; an account of legal proceedings taken to compel drainage, cleanliness, &c., and the results; and lastly, a tabular statement of the visits to and state of the slaughter houses.

3rd. I would also ask that a quarterly tabular statement of the registered lodging houses should be prepared and presented to you, which should set forth the name of the keeper, the number, and street where situated, the numbers for which license has been given, and the state as to cleanliness, ventilation, water supply, and especially overcrowding.

In conclusion, I must ask you seriously to bear in mind the prevalence of epidemic cholera in many of the cities and towns of Asia and of Europe during the last year. In Paris alone, above 7,000 persons fell victims to this disease; the last case occurred as recently as the 14th of January. Since then the disease has prevailed in the great naval ports of France, Brest and Cherbourg; the latter town within 84 miles of, and in constant communication with Southampton. It is even now raging in the town of Caen, opposite Brighton. I have been privately informed that the disease is now very fatal in the kingdom of Saxony, in the colliery districts around Chemnitz and Glogau.

It is right to prepare for the possible advent of a disease whose power to destroy life is so great. How to prepare, the late Dr. Kay pointed out in his report, page 65. He said :—

"Cholera is the direct result of sanitary neglect; it is an invited, not an obtruding visitant. It may hover over a town, but unless attracted by local causes, it passes by a passive wanderer, impotent for mischief. It is the noxious elements of disease encountered in the foul, damp, and polluted atmosphere of uncleansed and filthy localities that impart to it activity and virulence; and knowing that such, and *such only*, are the circumstances under which its destructive powers are called forth, it is for *you*, as a local Board of Health, to avail yourselves of the resources placed at your disposal, and by strenuous and well directed efforts seek to ward off or mitigate the threatened calamity."

T. J. DYKE,

*Medical Officer of Health.*

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Mr. E. Lewis, the Assistant Overseer, ditto.
Mr. H. Wrenn, Superintendent of Constabulary.
Messrs. Smith and Jenkins, Clerks to Burial Boards.
Messrs. Kelly, Goodfellow, and J. Williams.
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REES LEWIS, PRINTER, 46, HIGH STREET, MERTHYR.